United States Patent [19]

Harris et al.

[11] **3,945,064**

[45] **Mar. 23, 1976**

[54] **ADJUSTABLE BED FRAME CONSTRUCTION**

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[73] Assignee: **Harris-Hub Company, Inc.,** Harvey, Ill.

[22] Filed: **Apr. 4, 1975**

[21] Appl. No.: **564,987**

[52] **U.S. Cl.** **5/181**; 5/184; 5/202; 248/408

[51] **Int. Cl.²** **A47C 19/00**

[58] **Field of Search** ..... 5/181, 184, 185, 200, 201, 5/285; 248/353, 354 R, 354 P, 413; 403/107, 108

[56] **References Cited**

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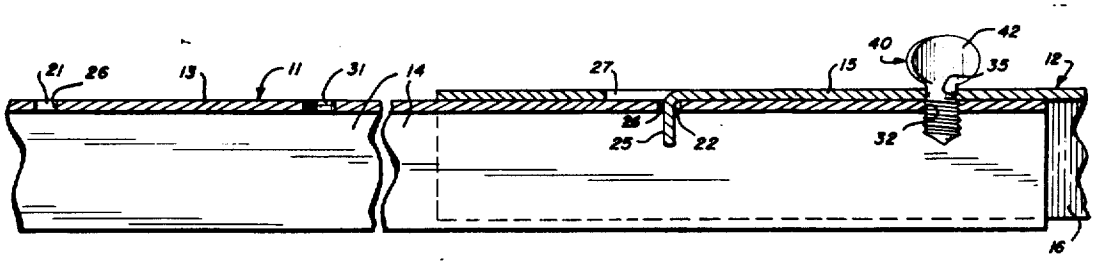
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[57] **ABSTRACT**

An improved adjustable cross frame member for use in a bed frame having side frame members and another such adjustable cross frame member. Each cross frame member comprises a pair of elongate elements including first and second perpendicular legs. One of the first legs has a plurality of longitudinally spaced position defining apertures corresponding to selectable positions of the cross frame member. The other of the first legs has a protrusion engageable with one of the apertures for retaining the elements against longitudinal movement in both directions when like legs of the elements are positioned in surface-to-surface adjacency. A locking means retains the elements against separation and includes a plurality of longitudinally spaced threaded openings in the first leg of the first element, each opening being associated with a corresponding aperture. A releasable locking member comprising a thumb screw is permanently mounted on the first leg of the second element and is engageable with the threads in one of the openings to retain the elements against separation.

4 Claims, 3 Drawing Figures



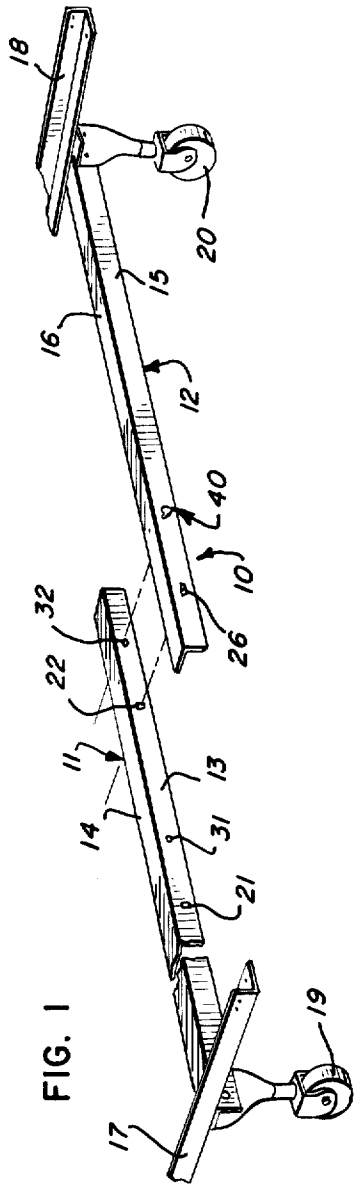


FIG. 1

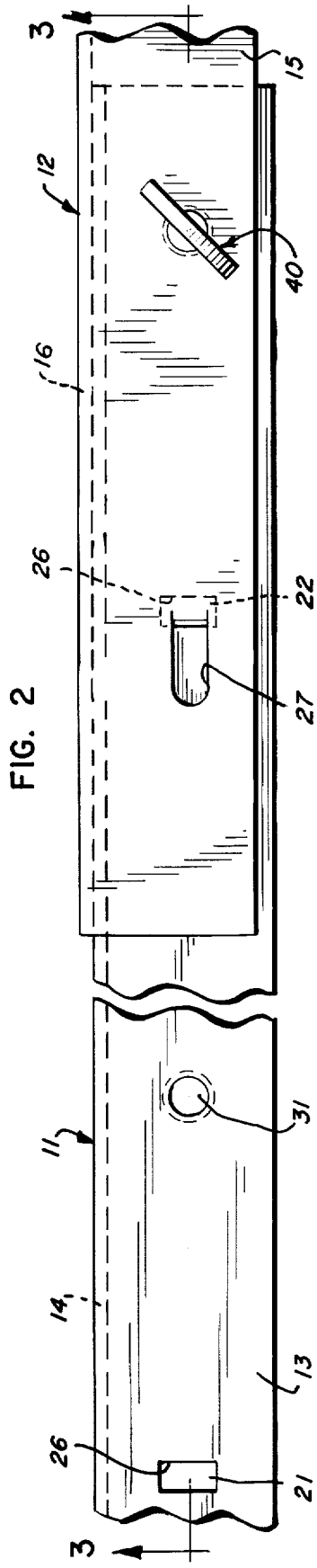


FIG. 2

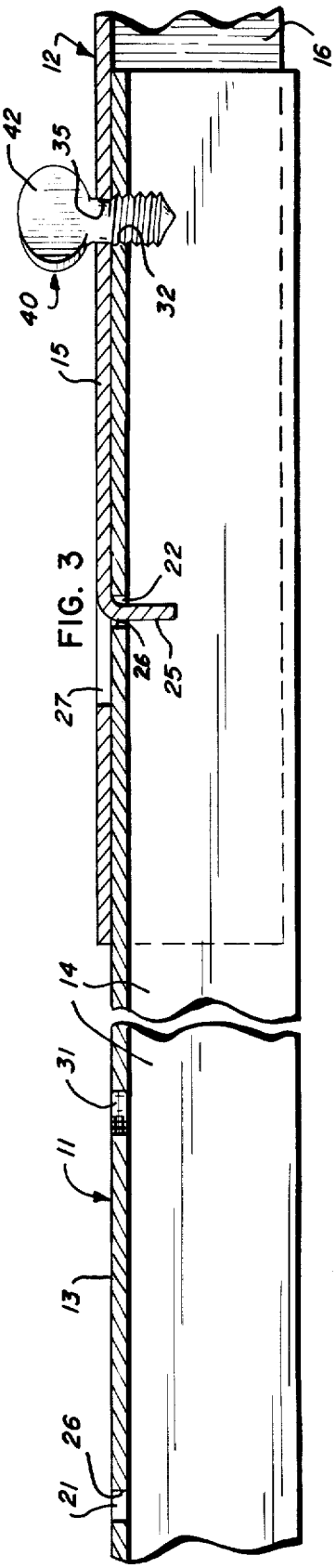


FIG. 3

ADJUSTABLE BED FRAME CONSTRUCTION

BACKGROUND OF THE INVENTION

This invention relates generally to bed frames of the knock-down type and in particular to frame members comprised of two or more elements to be fastened together.

As is detailed in commonly assigned U.S. Pat. No. 3,646,623 to A. E. Harris and W. E. Behnke for "Bed Frame Assembly," U.S. Pat. No. 3,757,361 to G. M. Harris and W. E. Behnke for "Adjustable Bed Frame Member," U.S. Pat. No. 3,744,068 to A. E. Harris for "Adjustable Bed Frame Member," and U.S. Pat. No. 3,795,022 to G. M. Harris for "Adjustable Bed Rail Member Having a Locking Arm," a problem has long existed in the art because conventional bed frames of the above type have not provided positive interlocking engagement between cross frame members, and have required the use of a large number of fasteners, making it time-consuming to assemble and disassemble the bed frame assembly. Furthermore, with the advent of "king size" and "queen size" bedding, bed frame manufacturers have found it necessary to stock undesirably large inventories of bed frame assemblies of a given size, because of the complete lack of an easily manipulable and reliable means for adjusting the width of the bed frame assembly. The inventions of the above-referenced patents have solved such problems quite well, and have met with a very considerable degree of commercial success in so doing.

In order to further accommodate the quite evident demand for bed frames responsive to the above problems, it has also become desirable to furnish an adjustable bed frame member having the advantages of the above-referenced patents and which is even more conveniently and rapidly adjustable, and assembled and disassembled, and which at the same time has a lower cost and even more simplified construction.

SUMMARY OF THE INVENTION

Accordingly, bed frame members constructed in accordance with the present invention solve the problem encountered in the prior art by providing a secure but readily releasable interlocking relationship between bed frame elements which allows the bed frame to be quickly and easily assembled to one of a plurality of desired widths. The bed frame members of the present invention are useful as a side frame member as well as a cross frame member.

The improved adjustable bed frame member of the present invention is adapted to be fastened transversely between a pair of horizontally disposed further bed frame members so as to hold said further bed frame members in spaced parallel relationship. The improved member has first and second elongate elements. One of the elements is adapted at one end to be fastened to one of the pairs of further bed frame members and includes first and second generally perpendicular flat legs. The other element is adapted at one end to be fastened to the other of the pairs of further frame members and also includes first and second generally perpendicular flat legs. One of the first legs is provided with a plurality of longitudinally spaced apertures corresponding to selectable positions of the cross frame member while the other of the first legs is provided with an outwardly extending protrusion which is engageable with one of the apertures for retaining the elements

against longitudinal movement in both directions relative to one another when like legs of the elements are positioned in surface-to-surface adjacency with respect to one another. Depending on which of the plurality of longitudinally spaced apertures is selected for cooperation with the detent, one or another of a plurality of possible positions of adjustment is chosen in order to give the overall member the desired length.

In order to complete the assembly of the respective first and second elements at the selected position of adjustment, the improved adjustable frame member further includes a cooperating locking means for retaining the first and second elements against separation. Such means includes a plurality of longitudinally spaced threaded openings in the first leg of the first elongate element, with one of the openings being associated with each of the selectable positions. The locking means also includes a releasable locking member comprising a screw means permanently mounted on the corresponding first leg of the second elongate element and engageable with the threads in one of the threaded openings for retaining the elements against separation.

The apertures and openings are preferably disposed on the same leg of the same element. The spacing between each threaded opening and its respective aperture is the same and, correspondingly, the screw means is spaced from the protrusion by a distance equal to the spacing between each threaded opening and its respective aperture.

In the preferred embodiment, the screw means is a thumb screw and has a manually graspable tab portion for effecting a turning movement so that upon the placement of the elongate elements in face-to-face adjacency with one another and the engagement of the protrusion with the aperture associated with the desired position of adjustment, the graspable portion is manipulable to turn the thumb screw and lock the elements in positively held together relationship in the selected position of adjustment. The bed frame member which is thereby formed is indefinitely held together in the desired adjustment and acts just as a continuous one-piece member. Yet upon manipulating the graspable tab portion to turn the screw in the opposite direction, the screw can be withdrawn from the opening and the elements can be separated to quickly and easily dissassemble or readjust the bed frame member to another desired length.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an exploded view, partially broken away, of the improved bed frame member of the present invention;

FIG. 2 is an enlarged fragmentary front elevational view of the improved member with its elements locked in a selected position of adjustment; and

FIG. 3 is an enlarged fragmentary sectional view taken along plane 3—3 of FIG. 2.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

While this invention is susceptible of embodiment in many different forms, there is shown in the drawings and will herein be described in detail a preferred embodiment of the invention, with the understanding that the disclosure is to be considered as an exemplification of the principles of the invention and is not intended to limit the invention to the embodiment illustrated. The

scope of the invention will be pointed out in the appended claims.

Referring now to the drawings, FIG. 1 shows the improved adjustable cross frame member **10**, which is comprised of elongated elements **11** and **12** which are preferably L-shaped, but may also be C-shaped or other suitable shapes. Element **11** includes first and second generally perpendicular legs **13** and **14** of similar transverse widths; and element **12** includes first and second generally perpendicular legs **15** and **16** of similar transverse widths. Elements **11** and **12** are respectively fastened at one end to side frame members **17** and **18**, and are positioned so that both leg portions **13** and **15** are vertically oriented and both leg portions **14** and **16** extend outwardly horizontally from the upper edges of legs **13** and **15**, respectively. Side frame members **17** and **18** have legs with casters **19** and **20**. As is well understood in the art, cross frame member **10** cooperates with an additional identically constructed cross frame member (not shown) spaced therefrom and parallel therewith to form a bed frame, in combination with side frame members **17** and **18**. Elements **11** and **12** may be formed of commercially available cold rolled steel, and hence are relatively inexpensive.

In the illustrated usage, cross frame member **10** provides for a rapid and positive adjustment of the bed frame assembly to accommodate bedding of various sizes, as will be described below.

Element **11** is provided with a plurality of longitudinally spaced apertures **21**, **22** lying along a common line in vertical leg **13** generally medially of the leg. Each aperture defines a selectable position of adjustment; thus, aperture **21** is the widest position of adjustment of member **10** and aperture **22** corresponds to a first medial position of adjustment corresponding to bedding of a smaller size. Though only two apertures are illustrated, additional apertures corresponding to the desired positions of adjustment are contemplated.

Longitudinal movement between elements **11** and **12** is prevented in both directions by providing a detent means such as finger **25** (FIG. 3) which protrudes from leg **15** of element **12** and is engageable with one of the apertures **21**, **22** provided in leg **13** of element **11**. As shown in FIG. 3, finger **25** protrudes outwardly from leg **15** of element **12** and is insertable through one of apertures **21**, **22** corresponding to the desired adjustment of the bed frame. When like legs of elements **11** and **12** are positioned in surface-to-surface adjacency with respect to one another, finger **25** engages the sidewall **26** of one of the apertures to retain elements **11** and **12** against longitudinal movement in both directions relative to one another. Leg **14** bears upon leg **16** and is supported thereon when elements **11** and **12** are assembled. As illustrated in FIGS. 2 and 3, apertures **21**, **22** are generally rectangular and are preferably, but not necessarily, shaped to correspond to the configuration of finger **25**, thereby limiting movement of finger **25** when inserted in a selected aperture.

To minimize the number of parts and the cost, it is preferable to have finger **25** integral with leg **15**. One way of providing an integral finger **25** is by a stamping or punching method to bend a rectangular portion of leg **15** from the plane of leg **15**, leaving slot **27** in leg **15**.

A locking means is provided for retaining elements **11** and **12** against separation when a position has been selected and the elements are positioned in surface-to-surface adjacency with respect to one another. The locking means includes a plurality of longitudinally spaced openings **31**, **32** in leg **13** which are associated with apertures **21**, **22** and correspond to the selectable positions of bed frame member **10**. As shown in FIGS. 2 and 3, openings **31**, **32** are threaded to receive a screw. The spacing between each threaded opening and its respective aperture is the same.

Similarly, leg **15** of element **12** has a threaded opening **35** which is spaced from finger **25** a distance corresponding to the distance between aperture **21** and opening **31** in leg **13**, and has a diameter equal to the diameter of openings **31**, **32**.

As best shown in FIGS. 2 and 3, the locking means further includes a releasable locking member comprising a screw means such as thumb screw **40** which is receivable in the opening **35** in leg **15** of element **12**. Thumb screw **40** is permanently held in opening **35** in leg **15** by turning screw **40** until it has gone all of the way into threaded opening **35**, and then further turning screw **40** until the thread in opening **35** and the thread on screw **40** are partially stripped, thereby preventing withdrawal of thumb screw **40** from leg **15**. After the thread in leg **15** is stripped, thumb screw **40** can be freely turned while permanently held in opening **35**, thereby enabling insertion of the thumb screw into one of the threaded openings **31**, **32** in leg **13** with which thumb screw **40** is engageable for retaining elements **11** and **12** against separation. Thumb screw **40** has a manually graspable tab portion **42** which facilitates in turning the screw for insertion in leg **13** of element **11**.

Although apertures **21**, **22** and openings **31**, **32** are illustrated as being in the same leg of the same element, it would also be possible to have the apertures and openings on corresponding legs of opposite elements, and even on opposite legs of the opposite elements.

Assembly of the elements **11** and **12** is a simple two-step operation which may be executed very rapidly. First, elements **11** and **12** are brought together so that like corresponding legs are in surface-to-surface adjacency. The particular aperture and corresponding opening in leg **13** which are selected for use with finger **25** and thumb screw **40** is determined by the length adjustment which is desired to be selected for the complete member **10**, with one adjustment being that associated with aperture **21** and opening **31** and the longest adjustment being that associated with aperture **22** and opening **32**. It will be appreciated that with the engagement of finger **25** within an aperture, relative longitudinal movement of elements **11** and **12** is prevented in both directions, although separation of the elements is still possible.

In order to preclude such separation and thus fully lock elements **11** and **12** in positively held together relationship in the selected position of adjustment, thumb screw **40** is manually grasped and turned until elements **11** and **12** are tightly held together.

Once a position of adjustment is selected and finger **25** and thumb screw **40** are inserted through an aperture and opening in leg **13** and the thumb screw is turned, the legs of the respective elements cannot separate and cannot move transversely or longitudinally with respect to one another.

In addition to retaining elements **11** and **12** together, thumb screw **40** and finger **25** provide spaced bearing points for load distribution once the bed frame has been assembled, and a box spring and mattress (and/or user) bears thereon. The result is a rigid cross rail member **10** having a selected one of a plurality of available lengths whose rigidity and adjustment is maintained

indefinitely yet which is instantly modifiable or dissassembled by turning thumb screw **40** in the opposite direction to withdraw thumb screw **40** from engagement with the threads in the selected opening in leg **13**. Elements **11** and **12** can then be separated, whereupon a new adjustment may be selected, if desired.

We claim:

1. A bed frame member adapted to extend transversely between a pair of further bed frame members positioned in spaced parallel relationship, and be retained in one of a plurality of selected positions, comprising: a first elongated element having first means adjacent one end for fastening said first element to one of said further bed frame members, said first element including first and second generally perpendicular flat legs; a second elongated element having second means adjacent one end for fastening said second element to the other of said pair or further bed frame members and including first and second generally perpendicular flat legs; a plurality of longitudinally spaced apertures in one of said first legs, each aperture corresponding to one of said selectable positions; a protrusion on the other of said first legs and engageable within one of said apertures for retaining said elements against longitudinal movement in both directions relative to one another when like legs of said first and second elements are positioned in surface-to-surface adjacency with respect to one another; and cooperating locking means for retaining said elements against separation when a position has been selected and the legs of said elements are positioned in surface-to-surface adjacency with respect to one another, said locking means including a plurality of longitudinally spaced threaded openings in said first leg of said first element, each opening being associated with one of said apertures and corresponding to one of said selectable positions, the spacing between each threaded opening and its respective aperture being the same, a threaded opening in the first leg of said second element and having the same diameter as the threaded openings in said first leg of said first element, the thread in said opening in said first leg of said second element being partially stripped, and a releasable locking member comprising a screw means having a partially stripped thread received in said opening in said first leg of said second element to permanently mount said screw means on said second element, said screw means being engageable with the threads in one of said openings in said first leg of said first element for retaining said first and second elements against separation, and said screw means being spaced from said protrusion by a distance equal to the spacing between each threaded opening and its respective aperture.

2. A bed frame member as defined in claim **1** wherein said screw means comprises a thumb screw having a manually graspable tab portion.

3. A bed frame member as defined in claim **1** wherein said apertures and said openings are on the same leg of the same element.

4. A bed frame member as defined in claim **1** wherein said protrusion is integral with the other of said first legs.

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